

REMARKS

Claims 1-9 and 20-30 remain in the present application. Claims 10-19 and 31-53 have been previously canceled without prejudice. No additional claims fee is believed to be due.

Claim 1 has been amended to more specifically define the claimed nasal composition as being a nasal composition that is a homogeneous liquid solution. Support for this amendment is found in the specification at page 7, lines 13-15 and Examples I-VI.

Claims 2-3, 21, and 23 have been amended to recite the "by weight" concentration of the claimed components. Support for these amendments is found in the specification at page 6, lines 7-8 for the pyroglutamic acid, Examples I-IV for the organic acid, and page 10, lines 4-5 for the metal salt.

Claim 3 has also been amended to correct a typographical error in the recitation of the term "an" rather than the term "the".

Claims 21-22 have also been amended to correct typographical errors in the recitation of the term "compositions" rather than the term "composition".

Invention Synopsis

The present invention is directed to respiratory tract compositions, particularly homogeneous liquid nasal compositions, which provide for the prevention and treatment of cold and influenza viruses, wherein the claimed compositions comprise a combination of pyroglutamic acid and a specifically defined organic acid for the treatment of cold and influenza viruses.

It has been found that nasal compositions containing a combination of pyroglutamic acid and an organic acid having a pKa value of from about 3.0 to about 5.0 can provide a surface pH of the nasal cavity tissue to create a nasal environment that is hostile to cold and influenza-like viruses. Nasal cavities having a pH in the range of from about 3.5 to about 5.5, which is provided by the compositions of the present invention, have been found to deter viruses which can lead to respiratory tract viral infections that can result in cold and influenza like symptoms. These compositions are especially effectively when the compositions are sprayed into the nasal turbinates.

Art Rejections

Claims 1-9 and 20-30 have been rejected under 35 U.S.C. 103 as being unpatentably obvious over Gangadharan et al. (U.S. Patent 5,643,582) in view of Szentmiklósi et al. (U.S. Patent 5,244,880) and Davidson et al. (U.S. Patent 6,080,783), and further in view of Yamamoto et al. (EP 302,772). The Examiner contends that it would have been obvious to incorporate the pyroglutamic acid disclosed in Szentmiklósi et al. and the zinc salt disclosed in Davidson et al. into a composition of Gangadharan et al., to thereby realize Applicants' invention, notwithstanding Szentmiklósi et al.'s failure to disclose nasal formulations and Davidson et al.'s failure to disclose nasal compositions comprising pyroglutamic

acid. The Examiner further contends that Yamamoto et al. provide teaching of the state of the art for the inclusion of carboxylic acids into nasal compositions. Applicants respectfully traverse these rejections as they would apply to the amended claims.

Gangadharan et al. disclose moisturizers which are in the form of oil-in-water systems, and which are suitable for rehydrating or maintaining hydration in skin and mucous membranes. The moisturizers disclosed in Gangadharan et al. comprise a water soluble polymer having bioadhesive properties in combination with a humectant, one or more preservatives including benzoic acids and its salts, a pharmaceutically acceptable oil, and bilayer particles dispersed in selected glycerides. Suitable humectants disclosed in the Gangadharan et al. reference include 2-pyrrolidinone-5-carboxylic acid salts (i.e., pyroglutamic acid salts). Gangadharan et al. further disclose that the moisturizers can be administered to different epithelial cells for dermis and mucous membrane contact including the epithelial cells of the buccal and nasal regions. Gangadharan et al., however, fail to disclose a moisturizer in the form of a homogeneous liquid nasal composition, wherein the homogeneous liquid nasal composition comprises a combination of a pyroglutamic acid and an organic acid having a dissociation constant (pKa) value of from about 3.0 to about 5.0.

Szentmiklósi et al. disclose pharmaceutical and cosmetic compositions which comprise aqueous solutions of primycin and pyroglutamic acid. In addition to primycin and pyroglutamic acid, Szentmiklósi et al. disclose that the pharmaceutical or cosmetic compositions can optionally comprise other therapeutic actives such as antibacterial (e.g., oxolinic acid) and/or anti-inflammatory agents. The compositions disclosed in the Szentmiklósi et al. reference are further described as clear, stable aqueous solutions which are formulated as topically applicable pharmaceutical compositions and disinfecting cosmetic compositions. Szentmiklósi et al., however, fail to disclose a pharmaceutical composition in the form of a nasal composition, and certainly fail to disclose a nasal composition comprising pyroglutamic acid in combination with an organic acid having a dissociation constant (pKa) value of from about 3.0 to about 5.0.

Davidson et al. disclose a viscous gel which is suitable for delivering zinc or another metal to the nasal membrane. The viscous gel of Davidson et al. comprises a carrier and preferably a zinc gluconate compound wherein the zinc gluconate produces concentrations of ionic zinc for delivery into the nasal cavity. Davidson et al. further disclose that the viscous gel has a viscosity in the range of from 5,000 to 20,000 centipoise to facilitate maintenance of the gel in the nasal cavity. Davidson et al., however, fail to disclose a homogeneous liquid nasal composition comprising a combination of pyroglutamic acid and an organic acid having a dissociation constant (pKa) value of from about 3.0 to about 5.0.

Yamamoto et al. disclose nasal powder compositions which comprise calcitonin active ingredient, and a water-soluble organic acid as an absorption promoter. Suitable organic acids include succinic acid, tartaric acid, and glucuronic acid. Yamamoto et al., however, fail to disclose a

homogeneous liquid nasal composition comprising a combination of pyroglutamic acid and an organic acid having a dissociation constant (pKa) value of from about 3.0 to about 5.0.

Applicants submit that the combined disclosures of the Gangadharan et al., Szentmiklósi et al., Davidson et al., and Yamamoto et al. references, in any combination, fail to realize Applicants' invention of Claims 1-9 and 20-30, as amended. None of these applied references teaches or suggests a nasal composition comprising pyroglutamic acid in combination with an organic acid having a dissociation constant (pKa) value of from about 3.0 to about 5.0, wherein the nasal composition is a homogeneous liquid solution.

The Examiner contends that it would have been obvious to incorporate the pyroglutamic acid of Szentmiklósi et al. and the zinc gluconate of Davidson et al. into the oil-in-water moisturizer of Gangadharan et al., to thereby realize Applicants' invention. The Examiner then asserts that Applicants' claims directed to a nasal composition does not involve any unobvious difference between the structure of the claimed composition and those of the cited references, and that the manner or method in which such claimed compositions are to be utilized is not germane to the issue of patentability of the composition. Applicants respectfully disagree with the Examiner, and state that contrary to the Examiner's contentions the Examiner has applied references that the Examiner considers to be analogous to the art of nasal compositions. Moreover, Applicants' amended Claims 1-9 and 20-30 are directed to a homogeneous liquid nasal composition comprising pyroglutamic acid and a specifically defined organic acid, which nasal composition is not taught by either of the applied prior art references.

The Examiner further contends that the Yamamoto et al. reference provides the teaching and suggestion for the skilled artisan to incorporate organic acids such as carboxylic acids into a combined composition of Gangadharan et al., Szentmiklósi et al., and Davidson et al., to thereby realize Applicants' invention. Applicants disagree.

Applicants submit that a combined disclosure of Gangadharan et al., Szentmiklósi et al., and Davidson et al., or Gangadharan et al., Szentmiklósi et al., Davidson et al., and Yamamoto et al. would still be deficient in teaching and suggesting Applicants' nasal composition. As suggested by the Examiner, the incorporation of Szentmiklósi et al.'s pyroglutamic acid and Davidson et al.'s zinc gluconate into a composition of Gangadharan et al. would result in an oil-in-water composition, not a homogeneous liquid nasal composition of Applicants' amended Claims 1-9 and 20-30.

In view of the foregoing remarks, it is submitted that the applied Gangadharan et al., Szentmiklósi et al., Davidson et al., and Yamamoto et al. references, in any combination, would not obviously lead the skilled artisan to a realization of Applicants' invention of amended Claims 1-9 and 20-30, prima facie or otherwise. Accordingly the rejections of Claims 1-9 and 20-30, as amended, as being unpatentably obvious over Gangadharan et al. in view of Szentmiklósi et al. and Davidson et al., and further in view of Yamamoto et al., are improper, and should be withdrawn.

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Conclusions

Applicants have made an earnest effort to place the application in proper form and to distinguish their claimed invention from the applied prior art. WHEREFORE, reconsideration of this application, withdrawal of the rejections under 35 U.S.C. 103, and allowance of Claims 1-9 and 20-30 are respectfully requested.

Respectfully submitted,

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